AVIATION

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The Arctic Expedition: Left to Right, Reber, Nold, Byrd, Schur and Loening

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SPECIAL FEATURES

N.A.A. RESOLUTIONS

THE ADMINISTRATION'S AIR POLICY

THE DESIGN OF AIR COOLED CYLINDERS

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The Anonymous Report

ANOTHER aircraft statement has been submitted to President Coolidge. This time, the source of the optimistic resume of the present state of aeronautics in this country is not disclosed, but it is clear from the contents, that the President has once more received a report which was prepared to smooth out some of the ruffled surfaces that have not appeared in an exactly favorable light since Congress adjourned.

The report gives details of the success of the Administration's aircraft policy. Careful reading of those parts of the report made public, discloses little new and nothing at a variance with the Lampert Committee testimony. The comparative aerial strength of the United States and other countries is avoided except as shown by world's air records. The impression created is that because we hold seventy per cent of the world's records to seventeen per cent for France, and none for England, that we have superiority in the air. While we agree heartily that American aeronautical engineers can produce the best service aircraft in the world, it is not well to have the public assume that the records made by the Barling Bomber, designed by an Englishman, the Fokker Transport (T2), designed by a Hollander, the F5L, designed by an Englishman, or the DH4, the backbone of American aviation, designed also by an Englishman, reflect great credit on American designing genius. Looking over the official world's aircraft records published in the March F.A.I. Bulletin, we find a total of 87 records listed. Of these, the United States holds 51, of which 29 are land records, and 22 seaplane records. Of the 29 land records, 18 were made by machines designed by foreigners. Of the 22 seaplane records, 5 were made by foreign designed planes. It will be seen by this analysis that 23 of the 51 world records held by this country were made by aircraft not designed by American engineers. Or to put it another way, American aeronautical engineers have designed aircraft that hold 28 of the 87 world's records. And 17 of these records were made by airplanes of which we only have one or two samples.

Our engines are undoubtedly the best in the world, and to them and the skill of our flying personnel are due the greatest credit. Too much emphasis is often given to the design of the plane whereas the engine and pilot are looked on as of minor importance. Record planes have their place in aeronautical development but should not be used to indicate national superiority.

The other part of the report deals with two vitally important subjects, the aircraft industry and air transport lines. We are informed that because $20,000,000.00 has been appropriated by Congress to purchase aircraft that the aircraft industry is on the threshold of better days. Here the report does differ sharply with the Lampert testimony which clearly showed that under the present organization and purchasing system, the mere expenditure of money in the future will be as futile as it has been in the past, in building up a sound aircraft industry. The prices at which aircraft are bought from the aircraft industry by competitive bidding has wrecked some of the oldest aircraft companies. So far as can be observed, the mere availability of funds does not indicate that there is a promised land in sight for the aircraft manufacturers. Were this true there would probably be new companies entering the field. But even with the prospect of an annual expenditure of twenty millions, there is no commercial group that we know of, contemplating the manufacture of military or naval aircraft, except the companies that have been in existence since the war or shortly thereafter or whose capital has come from large government orders. The President would do well to study this situation, for, as he very properly stated in his Budget Message, "To strengthen this industry is to strengthen our national defense."

When the report touches on civil aviation it makes several confusing statements. It states that it has been the policy of the government to make commercial aviation pay its own way and has been opposed to subsidies, that it has given a demonstration in the Air Mail and this demonstration together with the Kelly Bill has attracted some much needed capital to "the aircraft industry." If the public receives the impression that the Air Mail has at any time or on any route been a demonstration of aviation paying its way, it will be unfortunate, for the basis for praise of the success of the Air Mail has been on the grounds of practicability rather than its financial showing. It has been a perfect example of a government nourished or subsidized air line.

As to the capital that has been subscribed to the "aircraft industry," it is proper to point out that if even a fraction of the two million dollars, available to the new air line, were needed for aircraft manufacture, it would not have been forthcoming. We see Eastern capital seeking to take over the obviously profitable night flying service planned between New York and Chicago, but we hear nothing of Western capital desiring to take over the Western eight Air Mail routes or of anyone wanting to operate the present Eastern day routes. The policy of the government may be sound—to make aviation pay its own way and oppose subsidies, but it seems too early for the government to take credit for the recent air route activity unless it does so on the grounds that it is stimulating such development by indirect subsidies. AVIATION has always believed that government aid will be necessary at the start in commercial aviation. There is nothing to be gained by attempting at this early time to disclaim the perfectly plain fact that by utilizing government trained personnel and the facilities provided by the Air Mail, a group of men with large capital see a chance of operating an air line on a commercially profitable basis.

As it stands, the report to the President does not consider the one great problem of government aviation—organization and equipment—the two great problems of our national air defense.

The Design of Air-Cooled Cylinders

By C. FAYETTE TAYLOR

ACKNOWLEDGMENT The ideas set forth in this article are based largely on the results of experiments made by the Engineering Division, Air Service, and corroborated in the laboratories of the Wright Aeronautical Corporation.

The fundamental requirements for air-cooled cylinders for military aircraft engines may be stated as follows

(a) *Adaptability to Engine.* Unlike the water-cooled engine, which may have almost any cylinder arrangement, the air-cooled engine must be arranged primarily to secure proper cooling conditions for the cylinders In other words, the engine must be to a large extent designed for the cylinders, rather than the cylinders for the engine. However, the design of an air-cooled cylinder is influenced considerably by the type of engine on which it is to be mounted and the position of the engine relative to the stream of cooling air These considerations affect the size of the cylinders, the arrangement of the cooling fins, the position of the intake and exhaust ports, and the location of the valve gear supports and spark plug bosses.

(b) *Maximum power output* consistent with a reasonable fuel consumption This is attained through correct combustion chamber design, suitable arrangement of port and valves, and proper provision for cooling

(c) *Durability* The Army and Navy now require a minimum period between overhauls of approximately 200 hr of running, and entire freedom from major failures These results are obtained by proper selection and disposition of material, by proper lubrication of the bearing surfaces, and by efficient cooling of all parts to avoid burning of the material, destruction of the lubrication, or fatigue failure brought on by an overheated condition of the metal

(d) *Light weight* is a fundamental consideration in all aircraft equipment, but it cannot be obtained at any considerable sacrifice of the first three items Light weight is secured by careful selection and distribution of materials, always bearing in mind the considerations noted under (a), (b) and (c)

(e) *Cost of Production* While this is a very important consideration, it must be placed at the bottom of the list for military equipment, since it is not desirable to make any extensive compromise in the other requirements simply to reduce production costs For commercial aeronautics, however, this would be one of the most important requirements, and some of the others might have to be compromised in its favor

It is the purpose of this article to show how the fundamental requirements stated above are applied in detail to the design of air-cooled cylinders for military engines

Before starting the design of the cylinder, it is necessary to know the type and arrangement of the engine on which it is to be used, the normal speed of crankshaft rotation, and the power output required. It is also necessary to know the kind of fuel which is to be used, as this determines the maximum compression ratio which may be used The term "compression ratio" is defined as the ratio of the combustion chamber volume with the piston at top dead center to the total cylinder volume with the piston at bottom dead center For air-cooled cylinders operating on aviation gasoline, the practical high limit on compression ratio seems to be from 5 0 to 5 5, depending on the size of the cylinder Having determined the compression ratio, we know from experience approximately what power may be obtained per cubic inch of displacement for a cylinder of average design at a given speed of rotation of the crankshaft. Table 1 shows this for aviation type air-cooled cylinders running at various speeds, with a compression ratio of 5 2.

If our engine is to run, for instance, at 2,000 r.p m. and is to give 40 hp per cylinder, we can find the necessary piston displacement by selecting from table 1 the figure in the third column opposite 2,000 r p m. and multiplying it by 40. This gives 133 3 cu in. as the displacement necessary for the cylinder taken as an illustration

Having determined on the displacement for the cylinder it is necessary to select a bore and stroke which will give this displacement. Whether to select a large bore and a short stroke or a small bore and a long stroke, depends somewhat on the type of engine for which the cylinder is to be used. It is sometimes permissible to use a long stroke cylinder on a V-type or vertical engine, but on a radial engine this would be objectionable on account of the resulting large diameter of the engine One very important consideration is that there is room for larger valves in proportion to the displacement in the large bore, short stroke cylinder Modern American aircraft engine practice has tended toward cylinders in which the stroke is only slightly greater than the bore diameter, and in these engines the ratio of bore to stroke ranges from 0 71 to 1 0, the latter being the so-called "square cylinder," where the bore is equal to the stroke.

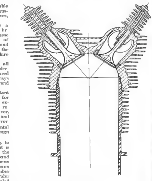


Fig 1

Since the cylinder with relatively large bore makes possible the use of large valves, we may assume a bore-stroke ratio of 0 91 In order to get the desired 133 3 cu in and maintain this ratio, we have a cylinder of 5 375 in. bore by 5.875 in stroke

The compression ratio, bore, and stroke of the engine having been determined, we are now ready to lay out the cylinder on the drafting board and proceed with the detail design.

The data given in table 1 shows the power output which may be expected from the average design It is possible, however, to exceed these values appreciably by careful application of the principles noted herein, and this will give a very desirable margin in excess of the power actually required from the engine.

It is hardly ever desirable to secure high power at the expense of fuel economy Fortunately, however, conditions favorable to a high power output tend to result also in good fuel economy, so that these two factors can well be considered together

The power output for a given size and speed is controlled largely by combustion chamber design, size of valves, size and shape of ports, and cooling of the cylinder. It has been the experience of nearly all experimenters that the nearer one can approach to a spherical combustion chamber, the better will be the results obtained This eliminates from consideration the irregular combustion chamber necessitated by the L head or T head engine, and confines us strictly to the overhead valve engine which is now universal in aircraft practice If the combustion chamber is to be approximately spherical in form, the cylinder head must be approximately hemispherical and the valves and ports must be inclined to the horizontal, as illustrated in Fig 1 Incidentally, this shape of combustion chamber facilitates the cooling of the cylinder, since it is well exposed to the air blast and has a large surface for the application of cooling fins. Fig 2 shows an inferior design having a flat combustion chamber head. It has been found that this type of cylinder always runs hotter, gives a much higher fuel consumption, and generally gives a lower power output than the type shown in Fig 1.

Valves

Having determined the shape of the combustion chamber, it becomes necessary to decide upon the size of the intake and exhaust valve. Experience has shown that in order to develop maximum power, it is necessary to have one square inch of intake valve opening for each 32 cu. in. of piston displacement. It is desirable to have an equivalent amount of exhaust valve opening, but where the space for the valves is restricted, the exhaust valve size may be reduced to a point where one square inch of valve opening serves as high as 40 cu. in. of piston displacement. Experiments have shown that it is possible to lift the valves to a height as great as one-fourth of their diameter and still count on the full area of the valve opening, provided there is sufficient space between the edge of the valve and side of the combustion chamber, so that the gas flow will not be restricted at this point. The figures given for valve area apply to the present tendency in air-cooled engine design, where the engines are run at speeds not exceeding 2,000 r.p.m For the very high-speed engines, one square inch of valve opening for every 25 cu in of piston displacement is desirable.

Number

For the cylinder taken as an example, we may assume that the normal operating speed will not exceed 2,000 r.p.m., and that one square inch of valve opening area will be provided for every 32 cu in of piston displacement for both intake and exhaust. For cylinders of less than 200 cu. in. displacement dual valves appear to be unnecessary, and therefore, for the engine in question, only one inlet and one exhaust valve should be used. Assuming that the valve lift will be one-fourth of the valve diameter, we arrive at a valve diameter of 2 3125 in in the clear with a lift of 0.5625 in Since the design of ordinary poppet valves, aside from their size, has a minor effect on engine performance, further details of valve design will be considered under the headings of "durability" and "cooling"

One of the most important considerations in securing maximum power output is the size and shape of the intake and exhaust ports The internal shape of the ports must be such as to offer the minimum resistance to the flow of the gases to and out of the cylinders, while their external shape must be such as to accommodate reasonable forms of intake and exhaust manifolds, and to offer the least possible interference to the flow of the cooling air around the cylinder head In order to offer the least possible restriction to gas flow, the passages within the ports must have easy bends with plenty of area at the bends, especially around the valve guide bosses. Rapid changes of section must be avoided, and the area of any section of the passage must always be as great as, or greater than, the clear area of the valve opening The external shape of the port will be considered under the next heading

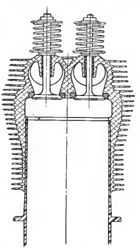


Fig 2

Perhaps the most difficult problem in air-cooled cylinder design is to secure proper cooling In considering this problem, two principles must be kept in mind, namely

1. The parts which receive the most heat are the parts which require the most cooling air

2. The blast of cooling air must impinge as directly as possible on the parts to be cooled, with a minimum dependence upon the conduction of heat through the metal

The parts which receive the most heat during engine operation are the exhaust valve, exhaust port, combustion chamber and cylinder barrel

In considering the cooling of the exhaust valve, it is obviously difficult to apply the second principle, since the valve is largely covered up by the valve seat, port, guide and spring,

and even the air which might otherwise get through the valve spring to the upper end of the valve stem is cut off when an enclosed type of valve gear is used. Consequently, in this case it is necessary to depend on the transfer of heat to the cylinder through the valve seat and valve guide. The proper cooling of the exhaust valve is therefore largely a question of providing ample area for the transfer of heat to the valve seat and valve guide, and then providing for the best possible air cooling of these parts. This involves some very careful design, and is a problem on which a great deal of study and experimenting has been done. An article by S. D. Heron in the *S A E Journal* for August, 1924, covers this subject very completely, and the reader is referred to this article for more complete information on the subject of exhaust valve cooling.

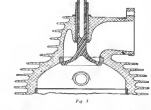


Fig 3

Proper cooling of the exhaust port depends primarily on its position with relation to the stream of cooling air. It is essential that the port be exposed directly to this air stream without interference from the intake port, manifolds, or exhaust pipes. The exhaust port must therefore be placed either directly in front, or at one side of the intake port, considering the "front" of the cylinder as the side against which the air stream is directed. It is usually desirable to face the port opening directly back, so that the exhaust pipe will not interfere with the free flow of cooling air to the port, valve seat and cylinder head. In a V-type engine, the cooling air is usually taken in through the front of the V and passed out between the cylinders. This necessitates placing the exhaust port in a position toward the inside of the V in order that cooling air may strike it as directly as possible. In this case, it is usually not possible to face the port away from the air stream, and in order to avoid interference with the air stream, the exhaust pipe is turned abruptly upward from the port opening and led out through the top of the cowling.

Cylinder Head

The combustion chamber walls of the cylinder require as much cooling as possible, especially over the valve seats, around the spark plug bosses, and at the points where the valve seats come nearest together. Without considering for the moment the question of finning the combustion chamber, a few remarks on its design may be helpful.

As mentioned before, a hemispherical or dome-shaped cylinder head brings the combustion chamber into such a position that a stream of air traveling in a direction at right angles to the cylinder axis impinges directly against the walls of the combustion chamber. The domed cylinder head shown in Fig. 1 is therefore much to be preferred over the flat head shown in Fig. 2. In order that the combustion chamber may receive the direct blast of cooling air on that portion surrounding the valve seats, it is necessary that the port elbows be raised well off the cylinder head so that the air can get underneath them and impinge on the metal adjacent to the valve seats. This is accomplished in a design such as that illustrated in Fig. 3, while that of Fig. 4 is a poor design in which no air space is allowed underneath the port elbow. In this latter case, a large portion of the valve seat must be cooled by the conduction of heat through the comparatively long space X shown in the figure.

Valve Ports

The ports must be arranged with ample air space between them, so that the cooling air passes directly over the hot portion of the combustion chamber which is always present between the valve seats. Fig. 1 shows how this should be accomplished, while Fig. 2 shows a poor design allowing no air space between the ports. This latter design results in over-heated and warped valve seats and valves, if run under high duty conditions such as are encountered in aeronautical work.

It is generally advisable to place the spark plug bosses in such a position that the spark plugs are directly in the air stream. On the other hand, it is essential to keep the spark plugs on opposite sides of the combustion chamber and as far from the valves as possible, in which case one of the plugs is usually at the back of the cylinder where it is more or less shielded from the air blast. Modern aeronautical spark plugs, however, have been developed to a point where they will stand up under this unfavorable condition, so that it is permissible, where absolutely necessary, to locate one of the spark plug bosses out of the direct air stream.

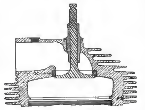


Fig 4

It may be pointed out that where the air stream is directed at right angles to the cylinder axis, the side of the combustion chamber away from the air stream might be sufficiently cooled. Advocates of the axial fin cylinder, where the air is blown against the top of the cylinder head in a direction parallel to the cylinder axis, usually base their claims for the advantages of this design on the fact that the entire combustion chamber is subjected to the direct air blast. This would be true if it were not for the unavoidable interference from valve ports and intake and exhaust manifolds. Furthermore the airplane installation of a design of this type would probably necessitate elaborate cowling and possibly blowers to give an adequate air blast against the cylinder heads. Experience has shown that by proper design of the combustion chamber, proper arrangement of the ports, and adequate cooling fins, the side of the combustion chamber away from the direct air blast does not become overheated.

(To be concluded)

The Administration's Air Policy

Commercial Aviation Must Pay Its Own Way and the Value of Records Main Points of Statement

The following statement was prepared in the Capitol as information for the President and gives the policy of the administration with regard to aeronautics. It shows that the appropriation of $19,193,375 is regarded as ample to sustain the industry at present. Such points as the number of first line aircraft in service and the organization of our aerial defenses are not touched on.—EDITOR.

President Coolidge, in his message to Congress transmitting the budget for the fiscal year 1926 on Dec. 1 last, stated: "Aside from the important factor of training personnel our national defense is largely an industrial problem. Today the outstanding weakness in the industrial situation as it affects national defense is the inadequacy of facilities to supply air service needs. The airplane industry in this country at the present time is dependent almost entirely upon Government business. To strengthen this industry is to strengthen our national defense." The President recommended, and the Congress has appropriated liberally for, the support of the aircraft industry. For the next fiscal year beginning July 1, the total amount appropriated for construction of aircraft, aircraft engines, and accessories for the Army and Navy, including contract authorizations, is $19,193,375. This sum is ample to sustain our present aircraft industry. The present aircraft industry, however, is only a nucleus of the industry that would be required in the event of a national emergency.

The problem is to strengthen the aircraft industry by encouraging and building up commercial aviation, and thus strengthening our national defense. The policy, in general, of the administration has not been favorable to subsidizing any industrial activity to the extent of artificially stimulating that activity. The administration's policy is to create, if possible, a healthy growth in any industrial activity, and, with reference to commercial aviation, the policy has been that commercial aviation must pay its own way.

The Government, in supporting the Air Mail Service, wished to demonstrate the practicability of aviation, and thereby stimulate its commercial development. The Post Office Department has successfully demonstrated the practicability and the reliability of transporting mail by airplanes, and has built up a ground organization, airways, and an operating personnel that command public confidence.

The present situation with regard to commercial aviation has been greatly stimulated by the passage of the Kelly Bill at the last session of Congress. This bill gives the Post Office Department power to contract with private enterprise for the carrying of mails by airplane. Requests for contracts to carry air mail have brought to the surface the fact that men of high standing in business are interested in "putting over" commercial aviation. The need in the aircraft industry has been for capital and the passage of the Kelly Bill, combined with the success of the Air Mail Service, indicates that this particular need is being filled. The Post Office Department has already invited bids for two short air mail routes, and it is understood that bids will be requested for two longer routes—one from New York to Chicago, and one from Kansas City to Chicago.

The experiment of a large motor manufacturer in Detroit will be watched with great interest. A landing field has been constructed with an adjoining factory for the manufacture of commercial airplanes, and an aviation service has been inaugurated between Detroit and Chicago. On this trial route a daily check will be made of the cost of the service, and at the end of a few months the rates that would have to be charged for the carrying of mail and express to make the air line show a profit will be known. Those in close touch with transportation problems are convinced that there is a need and a demand for fast freight and passenger service between large centers and that such a service can be operated profitably without support from the Government. The administration's policy of making aviation pay its own way is proving its soundness by the activities which have been inaugurated within the past few months. The principal obstacle to commercial development is the lack of airways, providing landing fields and service stations. The Air Mail Service has done excellent pioneer work in establishing an airway across the Continent, and, with the greater extension of the Air Mail system and the increase in public interest and confidence, the era of commercial aviation seems assured.

Technical progress in aeronautics in the United States since the war has been most satisfactory. This progress has been made possible by substantial appropriations by Congress, and today it can be safely said that we have in this country aviation engines from 60 hp. to 800 hp. that are the equal of, or better than, engines produced by any other country. The performance of aircraft built for military purposes is not excelled in any other country, and in certain types, such as pursuit airplane and observation airplanes, the performance of the airplanes built in this country far surpasses the performance of similar airplanes of any other country.

Air records for performance are not necessarily indicative of general progress but do in a measure reflect the technical development that has been made over a number of years. In the following table it is interesting to note the percentages of air records held by England, France, and the United States during each of the past five years.

Comparison of percentages of Air Records held by France, England and the United States.

	France	England	U S
1920	73%	16%	9%
1921	55%	18%	13%
1922	45%	30%	20%
1923	16%	5%	78%
1924	17%	8	70%

There is every reason to believe that the percentage of records for the United States for the year 1925 will be increased, indicating continued progress in America in the solution of the technical problems of aeronautics.

One phase of the development of commercial aviation in America which is not often given attention is the development of civil aviation. By "civil aviation" is meant the operation of aircraft by civilians for gain or for pleasure. The operators of such aircraft were usually known as "gypsy fliers," but in the last few years the "gypsy" has been developing into a fixed-base operator. At the present time there are twenty-two schools in operation, and their flying fields are scattered from coast to coast. The fixed base and the school have provided the incentive for the "gypsy flier" to keep his aircraft in better condition, and have placed him in a more stable and responsible financial position. In no other country in the world are there as large a number of civilian operators as there are in America, and their operations are not subsidized—it is simply another case where the airplane is being made to pay its own way. With the continued development of airways and the establishment of a Federal agency for the regulation of commercial aviation, the problem of the aircraft industry and the national defense will be solved.

Perry-Austen Dope on Arctic Planes

The wings and tail surfaces of the Loening Amphibian airplanes, recently delivered to the U. S. Navy, which are to accompany the MacMillan Arctic Expedition in the exploration, this summer, of the unknown areas around the North Pole, were treated with dope manufactured by the Perry-Austen Manufacturing Co., of Grasmere, Staten Island.

A. P. Loening, vice-president of the Loening Aeronautical Engineering Corp., of New York, stated that a very satisfactory finish was obtained with this dope.

The Tri-State Airway

By G. K. SPENCER

With the dedication of the "Tri-State Airway," opening direct air traffic between the East and the West via New Mexico, Arizona and California, the great Southwest is seen to be taking its place in the aeronautical world. The air route was dedicated May 16 and 17 at Winslow, Ariz., by Governors A T Hannett of New Mexico and G W P Hunt of Arizona

Since the early days of aviation in America, Arizona and New Mexico were looked upon as "the doubtful states" by military officials who foresaw a great commercial future for the airplane Throughout the ranks these two states were looked upon as out of the way in aeronautical things and until recent months, when the citizens who make up the mining and ranch element of the great Southwest demanded to be recognized as air-minded, little regard was given them by Army and Navy air officials. Dedication of the new air route, practically the work of the hands and the minds of every rancher and miner along it, definitely fixes Arizona and New Mexico as "air states" and it is expected that an official air mail route will be installed along the new airway

The story of the long battle of the two states, with the aid of Southern California, was told by Governor Hannett, who delivered the dedication address before the air clan and citizens of Arizona, New Mexico and California It was as romantic as the struggle of the early pioneers against the forefathers of the Hopi, Mojave and Zuni Indians, who performed before the governors following the dedicatory exercises.

So energetic were the citizens in obtaining air fields and equipment that today the "Tri State Airway" is looked upon as on a par with any in the country Capt Thomas T. Craven, who has flown over the air route and who commands the pilots at the Naval Air Station, North Island, Calif., says, "the 'Tri-State Airway' is one of the best in the country and is in some ways superior to those under the direction of the Navy and War Departments." This in itself is a tribute of which few airways can boast.

As a result of the enthusiasm of the citizens of the great Southwest every hamlet, practically, on the new air line has its own landing field, fully equipped to furnish all aviators with supplies and necessary mechanical aid. Weeks of their time were dedicated to the airway, Governor Hunt of Arizona told his audience at the dedication exercises in speaking of the work of miners and ranchers in establishing the "Tri-State Airway"

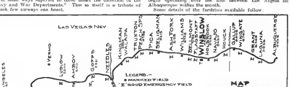
It was definitely announced at the dedication that the governors of the three states celebrating the opening of the air route will direct their road commissions to so construct the new roads and roads under repair that pilots can land and take off from them every three miles. As a consequence of this order, all roads in Arizona, New Mexico and California will become virtually landing fields in themselves. It is expected that this plan will be adopted by other states, inasmuch as "Ma" Ferguson as governor of Texas has shown interest in the plan and has expressed her approval of it. This is the first known action of its kind to be taken in the United States.

Associations Cooperate

Although the dedication exercises were held under the auspices of state committees, the National Aeronautical Association, the Aero League of the Southwest and the Commercial Aircraft Association played an important part. Officials of these organizations sent representatives welcoming the great Southwest into the realm of aeronautics.

Unofficial, but authentic, information, obtained by the writer, indicates that air mail may be flown over the new airway within a short time. Pilot "Bob" Hausler, chief engineer in the construction of the new air route, is now dickering to secure the rights to the air mail It is expected that two commercial aviation firms operating on the Pacific coast will begin operating over the line between Los Angeles and Albuquerque within the month.

Some details of the facilities available follow



Although the air route is constructed over rough country, it is not dangerous. Natural landing fields are numerous and it is practically possible for a pilot to land and take off every three miles along the route Where natural fields were not offered, the communities turned out and constructed landing fields of their own. Amboy, a community of seventy-five persons, was the first on the line of the airway which established its own landing field. According to Mayor Morgan, who explained to the writer the work of Amboy toward bigger aeronautical things, every man, woman and child assisted in the establishment of the airdrome.

Victorville, Calif—4 mi. east of town, on hog bear highway, T on second end of field Half mile square

Yermo, Calif—West of roundhouse a dry lake, good emergency. Planes have been landing on this field since 1921

Amboy, Calif—Marked field north of town, "T" and wind sock Field is treated with calcium chloride. There is also a dry lake south of town 4 mi square—a natural field.

Goffs, Calif—Good emergency field south of railroad station, 400 yd square.

Needles, Calif—Now clearing a new field, land at golf links or on banks of Colorado River on Arizona side emergency

only until new field is established. Golf links are 4 mi. north of Needles on a mesa.

Kingman, Ariz—Good field 2 mi east of town, 2200 ft. square, wind sock on north end of field near cemetery.

Kingman to *Walapai*—Landings can be made all along route

Truxton to *Seligman*—Landings can be made all along route

Seligman, Ariz—Field in east of town, south of railroad and stock yards, half mile square, wind sock on southeast corner of sheep corral

Seligman to *Ash Fork*—Emergency landings can be made all along route

Ash Fork, Ariz—Good emergency field north of railroad station 400 yd. long and 350 ft. wide. Several planes have landed here.

Williams, Ariz—Pearson Field is half mile east of town, north of railroad and highway, and west of branch line running to Grand Canyon, "L" shape field. One runway runs east and west and the other north and south Each runway is three quarters of a mile long and 300 yd. wide Wind sock on fence running north and south on west side of field DO NOT LAND where you see the three white circles as this is the old field

Belmont, Ariz—Field is north of railroad one quarter of a mile. You will see two large water tanks at railroad station, the field is north of these tanks and the highway Wind sock near wind mill Field is half mile square There are also several other fields around Belmont that are O. K

Emergency fields are plentiful between *Williams* and *Flagstaff*

Flagstaff, Ariz—Field is northwest of town, north of a three story red brick high school Wind sock on a barn north of high school First field is 400 yd long; next one north is half mile long and both are about 300 yd wide These are emergency only until new field is established.

Flagstaff to *Winslow*—Several good emergency fields

Winslow, Ariz—Field is east of town, north of the gas plant, and east of the high school Wind sock on grand stand "T" on east end of field. 650 yd. long, 300 yd. wide.

Winslow to *Holbrook*—Good emergency fields all along route

Holbrook, Ariz—Field is two miles northeast by east of town on a level mesa. Wind sock on the field 650 yd long and 300 yd. wide, north of railroad.

Holbrook to *Gallup*—Good emergency fields all along route

Gallup, N M—Field is 25 mi. west of town, south of railroad and highway Wind sock on telegraph pole Half mile long and 500 yd. wide.

Good emergency fields all along route *Gallup* to *Albuquerque*

Albuquerque, N M—Field three miles southeast by east of town near reservoir, south of reservoir Wind sock on corner of fence at reservoir Field half mile square

R. Ae. Soc. Annual Meeting

The 60th Annual General Meeting of the Royal Aeronautical Society was held at the Society's offices on March 31 In moving the adoption of the Council's report and the accounts, which showed a deficit for the year of £358 16s.10d., the Chairman (Lt. Col. H. T. Tizard) said that the Society had been passing through difficult times since the war which had culminated in the resignation of the Secretary, Lt. Col. W Lockwood Marsh. The Council felt that the loss of a permanent secretary was a serious matter but, after careful consideration of the possibilities of increasing the Society's income or decreasing its expenditure in other directions, had come to the conclusion that they had no other course but to accept the Secretary's resignation. The only possible way for the Society to pay its way was to lower the cost of administration and, much though they would feel the loss of Col. Lockwood Marsh, whose services to the Society and to aeronautics generally were well known, they must simply do the best they could with an honorary secretary, till better times came What the Society really needed to put it into a stable position was an endowment fund of, say, not less than £10,000 He mentioned this in the hope that the appeal might not fall altogether on deaf ears. In regard to honorary officials he would like to record their great appreciation of the services of the editor, J L. Pritchard, who had been looking after the Journal for five difficult years and had consistently declined to accept any honorarium for his services. In conclusion he referred to another matter of general importance Negotiations had been going on for some time with a view to the amalgamation of the Institution of Aeronautical Engineers with the Society and he was hopeful that a satisfactory solution would be found If the Councils of the two bodies agreed on a scheme it would be necessary for the agreement to be ratified at a special general meeting of the Society.

The adoption of the Council's Report was then formally moved and carried. On the motion of Wing Comdr. T. R Cave-Browne-Cave, seconded by Sir Henry White-Smith a resolution was adopted placing on permanent record the Society's great indebtedness to its retiring Secretary, Lt. Col Lockwood Marsh, for his conduct of the Society's business during five exceptionally difficult years.

Air Mail Aids Mine Relief

In a letter received recently by Postmaster General New from Secretary of the Interior Work the latter points out the great work performed by the Post Office Department's Air Mail Service at a mine explosion near Burke, Idaho, which took place on April 24, 1925

"The Bureau of Mines engineer of that district," Secretary Work wrote, "who was at Rock Springs, found that he was unable to get a train to Salt Lake City for many hours. He accordingly requested the Air Mail Service to transport him from Rock Springs to Salt Lake City, and this was done.

"As this was a situation in which the lives of miners were imperiled, the action of your Department in cooperating to provide speedy transportation to connect with the car proceeding to the scene of the disaster was most helpful. The hearty cooperation of the Superintendent of the Aviation Fields at Rock Springs and Salt Lake, and pilot James Murray, was especially appreciated"

Nonmetallic Diaphragms for Instruments

N.A.C.A. Report No. 206

This report, by H N Eaton and C T. Buckingham, the second of a series of reports relating to the general subject of instrument diaphragms, was prepared by the Bureau of Standards at the request of the National Advisory Committee for Aeronautics. The first report of the series was published as Technical Report No 165, "Diaphragms for Aeronautic Instruments," and comprised an outline of historical developments and theoretical principles with a discussion of expedients for making the best use of existing diaphragms.

The present report relates entirely to nonmetallic diaphragms, the use of which in certain types of pressure elements has been increasing for some time. Little, if any, information has been available, however, to aid the designer of instruments using this form of pressure element. It was to attempt to meet the need for such information that the investigation reported in this paper was undertaken

The report describes the various materials which have been used as nonmetallic diaphragms, discusses the factors which affect the performance of the diaphragms and gives the results of tests made for the purpose of investigating the effect produced by three factors. A theoretical discussion is given in which it is shown that the effective area of a nonmetallic diaphragm can be computed for specified conditions and hence the pressure-deflection curve can be predicted Curves are given to facilitate the computation of effective areas under any given conditions. The theory was tested experimentally and was found accurate within about 5 per cent. Finally pressure-deflection curves are given to illustrate the control which the designer has over the shape of the curve by varying the different parts of the pressure element.

Report No. 206 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

Program of N.A.A.

Policy Outlined in Program and Resolutions Adopted at St. Joseph Meeting

The Resolutions adopted at the meeting of the Board of Governors, National Aeronautic Association of U.S.A., at St. Joseph, Mo., April 30, 1925, are the most comprehensive that have yet been presented to the membership. They indicate that a careful survey of national air problems has been made. The program as officially announced follows:

1. To maintain a non-commercial, civilian organization whose influence shall always be directed toward the advancement of Aeronautics in the U.S.A.

2. To formulate and support a constructive and comprehensive national program of air development, to be carried out by governmental authorities during the next decade.

3. To furnish a means by which all other organizations may cooperate in furthering the American aeronautical cause.

4. To foster and supervise aviation contests directed to the progressive development of motors and aircraft which will be most serviceable to the government and to civilian enterprise.

5. To function as the representative of the F.A.I. in certifying records of aeronautical performance and all other matters.

6. To represent this country in the F.A.I. and in other international aeronautical conferences where civilian representation is proper.

7. To protect the industry from governmental monopoly of aircraft engineering and from destructive competition in letting of government contracts.

8. To bring about the creation of standing aviation committees in both houses of Congress.

9. To urge Congress to pass a comprehensive bill to regulate and foster civilian aviation through a Bureau of Civil Aeronautics in the Department of Commerce.

10. To advocate the ratification by the U. S. of the International Air Navigation Convention with reservations.

11. To assist in securing landing fields and air navigation facilities, to be provided by governmental and private agencies.

12. To encourage the use and extension of the U. S. Air Mail.

13. To collect and disseminate information as to practical use of aircraft in transportation, agriculture, forestry and other fields.

The Resolutions that were adopted were as follows:

Purchasing Aircraft of Secret Specifications

"That the privilege now secured by Federal statute, permitting the Army, where secret specifications are of military importance, to buy ordnance without competitive bids, be extended to the purchase of aircraft, and that where aircraft are bought by the United States Government for military purposes, and it is thought by the purchasing department that the secrecy of the design is of importance to the Government, that they have authority to buy such aircraft without competitive bids."

Urges Abandonment of Government Aircraft Manufacture

"That the N.A.A. urges the Government to abandon the manufacture of aircraft, either by the Army or by the Navy, and hereafter buy all of its requirements in the way of aircraft from commercial producers, and on the basis of actual performance, limiting specifications to capacity for performance."

Urges Bombing Tests

"That it is the sense of the Board of Governors of the N.A.A. that the Army and Navy should be requested to give particular attention to the matter of bombing in connection with the Air Services of both branches of the National defense and to the best possible organization of air attack."

Endorses Principles of Kelly Bill

"That a committee be appointed to draft a resolution endorsing the principles of the Kelly Bill, requesting the Postmaster General to put it into as extensive operation as is possible within the means afforded to him, and asking those who are in a position to, to bid for contracts under the Kelly Bill."

Recommends Forest Fire Patrol

"That whereas practical experience in Canada and obvious geographical facts in many portions of the forested areas of the United States would tend to show that the cost of forest fire patrol can be reduced and the protection against forest fires be increased by the use of seaplane patrols;

"Therefore, be it resolved by the Board of Governors of the National Aeronautic Association that the advantages of seaplane patrol of forest areas be brought strongly to the attention of the National Forester, the several State Foresters, and the press and public of the country, and that they be urged to initiate experiments with this form of fire patrol."

To Urge Ratification of International Air Convention

"That the chair be empowered to appoint a committee of three to wait upon the Secretary of State and the President of the United States, to present to them a petition that the International Air Convention of October, 1919, be ratified with such reservations as our welfare requires."

Seeks Cooperation of U. S. Chamber of Commerce

"That the delegates of the National Aeronautic Association be authorized to join in proposing to the United States Chamber of Commerce the following declaration, and that the President of your Association be empowered to secure the necessary approval by other members of the United States Chamber of Commerce.

'The National Aeronautic Association of the U.S.A., proposes a declaration endorsing the principles and methods heretofore sanctioned by the Board of Governors for the aeronautical development of this country, to wit:

The passage by the present Congress of a Federal Statute organizing the civil bureau of aeronautics in the Department of Commerce for the Federal supervision of air traffic, the examination and licensing of pilots, the inspection and licensing of aircraft, the establishment of air routes, the dissemination of aeronautical information and statistics, the regulation of foreign air commerce and our participation in foreign air commerce, the provision for the creation of an American merchant air fleet.

We urge upon the National Executive the desirability of ratifying the International Air Navigation Convention (Oct. 13, 1919), and thus providing for our participation in international flight.

We again urge upon all municipalities and states the establishment of adequate landing fields for the promotion of commercial aeronautics.

We urge the further development of the air mail and rapid extension of the air mail service as fast as it is possible to find routes that will prove remunerative.

We recommend increased governmental appropriations for aeronautics.'"

New York Pulitzer Race Invitation

"That the President be authorized to wire to New York and say that the N.A.A. will be very pleased to receive an invitation from New York for the Pulitzer race to be held there, in view of the fact that their fields have been favorably passed upon by General Patrick."

National Balloon Race

"That the name of the Elimination Balloon Race for the Gordon Bennett Trophy be changed to "National Balloon Race."

N.A.A. Ready to Make Performance Tests

"That the President announce that the N.A.A. was prepared to make official performance tests and that the price to be charged for these tests should be fixed by the Contest Committee of the Association, subject to the approval of its President."

Aviation Week Proposed—Commercial Air Meet

"Moved that a special committee be appointed to investigate the possibilities of a strictly commercial air meet and to draw up rules for such, and that the special committee make the rules general enough with the view to having them used by a number of different cities during Aviation Week, and make recommendations relative to an Aviation Week as an annual affair."

Policy of Review

"That it be affirmed that the policy of the Association in regard to the Review is that it will not take advertising; that we will treat all trade journals alike with regard to the material which will be sent out regularly from our office for publication."

Urges Larger Prizes for Commercial Rates

"That the N.A.A. hereafter encourage as much as possible the giving of larger prizes for commercial performance in aviation meets."

To Consider Permanent Home

"That the Finance Committee be constituted a special committee to consider the advisability of purchasing a permanent home for the association, as outlined by the President, with power to act in the event that they deem it advisable, or that they raise the funds."

Approves Detroit Air Meet

"That the Board of Governors approve the holding of such a meeting as is in contemplation by the Detroit Aviation Society, and that the Contest Committee be instructed to cooperate with them in order that the best route and rules may be worked out."

Limit Affiliated Membership to Local Chapters

"That it is the sense of the Board of Governors of the N.A.A. that we do not accept affiliated memberships from other organizations and that requests for affiliated memberships by other organizations be referred to the local chapters, and that the local chapters be empowered to work out such plan of either affiliation or cooperation or consolidation as may be mutually agreeable between the local chapter and that particular organization making the application, provided, however that only the local Chapter shall have the right to use the name of N.A.A. and no other in conjunction therewith."

Detroit Gets 1925 Convention

"That the 1925 convention of the N.A.A. be held in Detroit immediately prior to Labor Day, provided that the commercial airplane tour and "On to Detroit Race" is held at that time. In the event that that meet is abandoned, then that it be left to the discretion of the Executive Committee whether the convention shall be held in Detroit anyway, or whether it shall be held in connection with the Pulitzer Race or the Schneider Cup Race."

Recommends Extension of Pest Dusting for Aircraft

"That whereas the use of airplanes for the extermination of pests and protection of agricultural crops has proven successful, and

Whereas, it is the purpose of the N.A.A. to develop a greater use of the airplane through the country, and particularly in agricultural districts for such purposes;

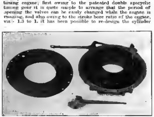
Therefore, be it resolved that our organization put forth every effort through sending communications and getting in contact so far as within our power lies, with the various agricultural organizations, state agricultural departments, etc. and give as much publicity as possible through various publications, to encourage the use of this method of combatting the evil of pests, which is so destructive to agricultural products.

And be it further resolved that a special committee be appointed for the purpose of collecting information on this subject and disseminating it under the direction of the president."

Increasing Engine Power at Altitude

The possibility of increasing the performance of an aero engine at altitude by using a variable timing gear which can be worked by the pilot as the machine ascends, has been realized for some time. Toward the end of the war when great performance at altitude was urgently needed, a scheme was put forward by Mr. Ricardo. He pointed out that by using a variable timing gear in conjunction with a high compression ratio and employing the simple expedient of closing the inlet valve late so that compression would not start until well up the compression stroke when near ground level, then the timing could be gradually advanced by the pilot, until at a predetermined altitude normal timing could be employed. By this means ground level power would be obtained up to the height at which the normal timing could be employed. From this height onwards, the H. P. of the engine would of course fall off, as with normal compression ratio engines, but there would be a considerable increase of H. P. available at all altitudes, and a marked fuel economy. This scheme for increasing the engine performance at altitude is far preferable to an oversize high compression throttled engine, in-so-much as with the former certain definite advantages are secured, such as a rising torque curve, a short compression and long expansion stroke, with an absence of preignition and detonation, etc. Owing to difficulties on existing conventional "in line" engines, however, this simple method of increasing power at altitude was never developed.

On the "Bristol" Jupiter Radial Aircooled engine it has been possible to obtain a practical solution of the variable timing engine; first owing to the patented double epicyclic timing gear it is quite simple to arrange that the period of opening the valves can be easily changed while the engine is running, and also owing to the stroke bore ratio of the engine, viz.: 1.3 to 1. it has been possible to re-design the cylinder



The Bristol variable timing gear for the Jupiter engine disassembled showing the worm gears for shifting the stationary annulus of the timing gear

with 6.3 to 1 compression ratio without obtaining an inefficient combustion chamber.

The illustration shows the gear as mounted on the nose of the Jupiter engine. There is a double worm gear controlling the stationary annulus of the timing gear. No moving parts of the engine are affected, so that the reliability of the engine is not detracted from in the least, and the additional weight to the engine is only 4 lbs.

On the test bench with the variable timing retarded it was found that the engine maintained ground level power at normal consumption. This engine was then mounted in the "Bristol" Bloodhound, a two-seater fighter, with which very careful performance tests had previously been made when fitted with a standard Jupiter engine. This machine has now been flying for the past three months, during which period an extended series of tests have been carried out. The results show a marked increase in performance between the aircraft when fitted with the standard Series IV Jupiter engine and when fitted with the engine with the variable timing gear. Throughout the tests the same pilot, same weight, and same propeller were used, and all figures have been carefully corrected, as the results are strictly comparative. These tests showed that on a climb to 18,000 ft., the time is reduced by eleven minutes by the use of the variable timing engine, and at 15,000 ft. the increase in speed is 8 m./hr.

The Wright Machine

The most recent developments in the controversy over sending the original Wright machine to England, are as follows.

Orville Wright, through Grover C Loening, president of the Loening Aeronautical Engineering Corp announced that he was not opposed to placing the original of his first airplane on exhibition in the Smithsonian Institution at Washington providing certain conditions are met.

Mr. Loening, after a personal interview with Mr Wright at his home, said he felt that conditions laid down by Mr Wright would be met.

They are that Dr. Walcott agrees to label the Wright airplane, now in Dayton, ready to be shipped to England, as the first successful man-carrying airplane in history, make the label now hanging above the Langley machine in the institution a "truthful statement" and publish the entire argument in the yearly record of the institution.

Upon this Mr Wright will consent to change his plans and keep the first flying machine in the United States.

Mr Wright told Mr Loening that he had agreed to give the plane to the English museum for a period of five years only If Dr Walcott will agree to the proviso, Mr Wright will not oppose any effort to have the gift to England canceled and kept in America, Mr Loening declared

Mr Wright told Loening that he would not give the plane to any American museum other than the Smithsonian Institution, as he felt it should go only to the national museum

In changing the label on the Langley plane Mr Wright declared he wanted the new label to note that the plane had been wrecked twice while it was being launched and had been altered

The National Aeronautic Association has issued a statement on the Wright-Langley dispute Parts of the opinion follow

The National Aeronautic Association much regrets that Orville Wright is sending his original airplane to an English museum, there to remain. It will be of interest to the general public briefly to review certain matters that may have contributed to this decision, but which Mr. Wright's modesty and retiring nature restrain him from fully explaining.

In the Smithsonian Institute they have on exhibition a flying machine This flying machine is not the machine invented, built and tested over the Potomac River in 1903, and is not the machine successfully flown at Hammondsport, N Y, June 2, 1914 The original machine was wrecked in launching, therefore the application of the word "man-carrying" airplane to it is based on conjecture and belief and not on actual performance.

The machine that hangs in the Smithsonian Institute has no skids nor wheels, nor attachments for throwing it into the air with a catapult, as was done with the original machine in 1903

At Hammondsport this machine was placed on pontoons, an invention made long after Langley was dead. These were an essential part of the machine that was flown at Hammondsport, and in its present condition it does not furnish either the means of getting into the air or of getting out of the air without injury

The National Aeronautic Association has recognized the great merit of Professor Langley by placing him No Four (4) on its honor roll The Wrights have gladly acknowledged their great indebtedness to their predecessors, and Langley in particular The wing curves of the model at the Smithsonian Institute (for model it is, and not a complete man-carrying flying machine), are very beautiful and were not surpassed in efficiency for many years The principle of control from behind has superseded the less convenient method first used by the Wrights. The propellers, however, are very crude, and nothing like as efficient as those used by the Wright Brothers.

It is significant that only one machine of the Langley construction was ever used in flight, and it was used only once; whereas the Wrights flew over 170 times before anyone else ever flew at all, and their longest flight up to the end of 1905 was over 23 mi. at a speed of 37½ mi./hr, which remained the record for many years.

We think it would be better to re-label the interesting model at the Smithsonian Institute as follows

"Langley flying machine rebuilt in 1914 after the original design of 1903, and flown with pontoons at Hammondsport, June 2, 1914.

This might still be contested on the ground that it was better than the original, which might or might not be true, but of little importance or interest to the public. Langley's greatest practical achievement, and which marked the high water mark of aviation at the time, was his automatic model which flew half a mile over the Potomac River in 1896

In a later statement, National Aeronautic Association says that it has in its possession a photograph of the so-called Langley Aerodrome in full flight over the water at Hammondsport in 1914 This machine differs from the machine hung up in the Smithsonian Institution in many important particulars, among them the following

First, the propeller is a modern stick type wholly different and more efficient than the propeller exhibited in the Smithsonian.

Second, the propeller is in front of the machine not near the middle of the machine, as in the Smithsonian model.

Third, the structural support of the wings is different.

Fourth, there are three pontoons on the Hammondsport machine and none on the model in the Smithsonian It would be just as convincing to hang up a model of a man without legs and say this is a facsimile of the man who won the great foot race in Madison Square Gardens.

Dr. Walcott himself states that at Hammondsport pontoons were put on. Without these this machine was as helpless as a man without legs.

Amundsen Not Heard From

As we go to press, no news has been received from the Amundsen Ellsworth North Pole expedition Signed instructions, which Amundsen left behind for use in case of his non-return according to schedule, were given to the fourteen members of the base party at Spitzbergen May 28

In these written instructions, addressed to the commander of the Farm as head of the base party, it is stipulated that the two mother ships are to wait fourteen days in the vicinity of Danes Island and Amsterdam Island At the conclusion of that period they are to go north and cruise along the ice barrier for a further period of four weeks.

The significance of these orders is that Amundsen felt it possible that his party might return by airplane long after the hop-off, and he apparently calculated that his return might be delayed in the extreme instance as long as five or six weeks

The order to patrol the edge of the ice barrier for the last four weeks is obviously given with the idea that the planes might be deserted for lack of fuel at no great distance from the northern tip of Spitzbergen, and the explorers thus forced to end their flight on foot.

In such event, the mother ship would be at hand to pick up the party when it reached drift ice and open water

Meeting of D. C. Chapter of N.A.A.

A luncheon was given by the D C Chapter of the N.A.A. at the Army and Navy Club on May 20. The Chairman, G W. Lewis, National Advisory Committee for Aeronautics, presided Among the guests were. General Fechet, Ass't. Chief of Air Service, U S Army, Capt. M. G Christie, Air Attache, British Embassy, F H Russell, Curtiss Aeroplane & Motor Co., Warren R Jackson, Des Moines Chapter of N.A.A.

Godfrey L. Cabot, president of National Aeronautic Association, told of the recent meeting of the Board of Governors and the National Balloon Race at St Joseph, Mo.

C F. Egge, superintendent Air Mail Service, described the building and lighting of the night airway from New York to Chicago and of plans for its early operation. Mr Egge also mentioned the possibility of starting contract postal airways under the provisions of a recent act of Congress, but also urged the need of most careful conservatism in establishing such airways

The New Pioneer Earth Inductor Compass

The Pioneer Instrument Co have recently completed a new type of their earth inductor compass. While no fundamental changes have been made from the earlier model which was used on the World Flight, the instrument has been considerably modified in structural details.

The outstanding change is in the generator driving mechanism, a small electric motor of special design being substituted for the air-impeller previously used This has permitted the redesign of the generator, making it lighter and more compact. The electric drive greatly facilitates the generator installation, as a good non-magnetic location can be selected without relation to the slip stream.

A new type of galvanometer-indicator has been designed especially for use in the earth inductor compass system This has been combined with the controller to make a single unit of the proper height for mounting with standard vertical instruments. The controller and meter can also be supplied separately, as heretofore, and in certain installations only the meter is placed in front of the pilot, the controller being handled by the navigator

The mitre gear box, used in the shaft line between the controller and the generator has been redesigned to permit the installation of two controllers with a single generator, allowing the full use of the compass from two positions.

While totally different from an ordinary magnetic compass, the Pioneer earth inductor compass is very easy to use, and to a pilot just learning to fly by compass, it should prove much simpler to understand The direction in which it is desired to fly is set on the controller, and the pilot then turns his ship until the indicator hand comes to zero

The functioning of the earth inductor compass depends upon the use of a generator wherein an armature rotates in the earth's magnetic field. From the analogy of an ordinary electric generator, it will be appreciated that the orientation of the generator brushes will disclose two positions of maximum potential and two positions of zero potential. When the earth inductor compass is installed a determination is made of the direction corresponding to one of these zero positions The controller is so connected to the generator brushes that this direction is indicated on the controller with the brushes in the zero-potential position. The subsequent rotation of the controller through any angle rotates the brushes through the same angle, and in order to re-establish the same angular relation between the brushes and the earth's field, the aircraft must be turned through the same angle, and hence is brought to the newly indicated heading

A table of essential data follows.

Generator	
Base dia.	9¼ in.
Mounting screw holes	
5 for No 10-32 screws on 7¾ in dia.	
Height	10¾ in.
Top clearance to permit removal of cover	1 in
Controller and Indicator	
Width	3-5/16 in.
Clearance back of instrument board	7¼ in
Other dimensions same as standard vertical instruments.	
Weights	
Generator	6 5 lb.
Controller and indicator	2 8 "
Mitre gear box	0.3 "
Bearing blocks each	0.1 "
Shafting, per foot	0 04 "
Four-wire cable per foot	0 04 "
Electric supply required	12 volts D C
Current consumption	1 amp.

The new compass is manufactured by the Pioneer Instrument Co., under the basic patent of L. D. J A Dunoyer. Mr Titterington, the chief engineer of the Pioneer Co., is responsible for the design of the present improved system.

The Indicator

The Compass Generator

AIRPORTS AND AIRWAYS

Oklahoma City
By Ralph King

Barnell Tibbs has quite an organization which is known as Tibbs-Schiers Flying Circus. They have three Canucks. "Pete" Louis is the performer. Nearly every Saturday and Sunday they have a show to some nearby town.

Bob Tarbutton is setting up a Hisso Standard which will be one of the prettiest ships in the state. He has a field leased 3 mi. north of the state capital building known as the Oklahoma Airport. It is a good field and well equipped.

Harley Richards will have his Canuck flying soon. The ship is painted in a novel manner, with orange wings with black stripes.

Curtis Attlebery is the youngest performer known in the state. He is eighteen years of age, and has made over one hundred parachute jumps. He expects to fly with "Billy" Collier this summer. He expects to challenge any boy in the world his own age, that they can not equal his stunts with airplanes, no matter how many years experience they have had. This challenge will be effective some time this fall.

"Billy" Collier is teaching Tyson to fly the Jenny the latter purchased recently.

"Billy" Tipton will do quite a bit of flying this summer. He was flying a Swallow nearly all winter. A short-wing Canuck will be one of his ships this summer.

Latecoere in 1925

For over five years the Latecoere company has been connecting France with its African possessions by the air route. The steady and real growth of this line indicates its economic value and it is more nearly comparable to our own Air Mail than is any other air line in Europe. During 1924 1,143,475 mi. were flown, 4,026,593 letters, 446,307 lb of express matter and 7,207 passengers were carried. There were no accidents during the year.

The home field at Toulouse has hangar space for forty planes. There are actually in use or in reserve 83 Breguet planes, 4 Farman type 70 and 10 Laore and Olivier besides several experimental planes built by the Latecoere factory.

The present schedule is a daily round trip between Toulouse - Perpignan - Barcelone - Alicante - Malaga - Tanger - Robert - Casablanca. Six trips weekly are made between Marseilles and Perpignan, four trips weekly are made from Alicante to Oran and two trips are made from Casablanca via Fez to Oran. There are fifty pilots employed on the line.

New Swedish Airline

Three new air routes are about to be opened for communication with Stockholm, according to recent press reports. The German Ministry of Communications has granted a subsidy to Deutsche Aerolloyd to be applied on the building up and operation of an air route from Danzig to Stockholm via Visby—a city located on a small island on the west coast of Sweden. Metal airplanes of the Dornier type are to be used, and the route will be covered six times a week. It is expected that the line will be ready some time in May.

The German company Junkers Luftverkehr A. G. has requested permission from the German Government to operate an air route between Berlin and Stockholm. German planes will be used on the entire route. The section Blekinge ((in southern Sweden) to Stockholm will require a duty, which will be refunded when the machines are taken out of the country at the end of the flying season. This duty has already been deposited with the Swedish customs administration.

A field will be constructed at Blekinge in order to break the journey from the German part of Warnemunde to Stockholm. As it is expected to begin night traffic in the near future, it has been deemed best to transfer the cargo into another machine at the Blekinge Field.

Denver, Col.

Colorado has just taken its first step toward its recognition of aviation as a permanent adjunct to both our commercial and military activities. Senate Bill No. 133, introduced at the last session of The General Assembly of the State of Colorado appropriates the sum of $38,000 for the Lowry Field located at Denver, Col., and the aviation field located at Pueblo, Col. Both of these fields are now being used by the 45th Division Air Service, Colorado National Guard. At present the equipment at Lowry Field in Denver consists of two steel hangars and one headquarters and office building, while the field in Pueblo has one steel hangar. This appropriation will allow the erection of one large building at Lowry Field to be used as a warehouse and school building for technical ground instruction and the sum of $10,000.00 for grading and leveling the present field which is badly in need of same. The Flight at Pueblo will erect one large building for warehoose and school rooms and office space. There is also set aside the sum of $3,200.00 for leveling and grading the flying field at Pueblo.

Upon completion of the project now under way this will give both Denver and Pueblo flying fields that will be available for use of all types of airplanes.

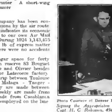


Photo Courtesy of Denver Post

Signing the Appropriation Bill for Lowry Field. Left to Right: Capt. H. C. Robinson, 45th Div. A. S.; Secretary of State Carl S. Milliken; District Gov. N.A.A.; and the Governor of Colorado, Clarence J. Morley

Helena, Mont.

Montana will be the home of an air line which will operate ships over a regular route and upon schedule between Butte, Mont., on the south to Great Falls, Mont., on the north. Lincoln Standard planes powered with 150 Hisso engines will be used in this service and the company will make a special effort to make the service attractive as well as convenient for those who use the same. None but experienced pilots will be used who have had at least 300 hr. at high altitude and over mountainous country, in addition to their other time. Fares will be so calculated as to render good service at the cheapest possible rates. The company will be headed by J. B. Black, a Montana pilot who knows the business as well as the country, and will be known as the Montana Airways. In addition to the aerial taxi service to be rendered, the Montana Company will operate and maintain a first class flying field and flying school at Helena.

It is planned to have the school and field in operation on June 1 and the taxi service started on a regular schedule.

Boston, Mass.
By Porter Adams

Two interesting aeronautical meetings were held in Boston during the week of May 18. The first was the annual banquet of the Aeronautical Engineering Society of the Massachusetts Institute of Technology held on the evening of May 20 at the Walker Memorial. The speakers included Peter C. Borre, a former captain in the Army Air Service and at the present time an attorney of Boston. Captain Borre told of the air service during the war and of the things necessary for us to do in order to regain supremacy in military and commercial aviation. Prof. Edward P. Warner, head of the department of Aeronautics at the Institute, who spoke instructively and amusingly of some of the letters he received from inventors stated that regardless of how many prominent automobile men become interested in aviation there will always be a vast difference between the construction, operation and work of aircraft and that of automobiles. C. Fay Taylor of the Wright Aeronautical Corp., told of the development of the Wright Cyclone engine, and Warren Noble, chief engineer of the Kinney Manufacturing Co., told of some of his early experiences in the development of automobiles and predicted that the great commercial air lines of the future would be operated or at least sponsored by the railroads due to the fact that in many of the larger cities the railroads with their terminal and freight yards offer the only available sites for landing fields in the centers of the cities. One of the incidents of the dinner was the drawing of names for the award of four free flights at the Boston Airport. Much amusement was created when the name of Lieut. James H. Doolittle was drawn as one of those entitled to a free ride at the Airport. It was announced that the following were the officers of the Aeronautical Engineering Society for the ensuing year—President G. G. Davidson; Vice President F. T. Kurt; Treasurer R. W. Hunter; Secretary E. Hofman.

* * *

The other meeting of interest was the smoker of the Greater Boston Chapter of the Military Order of the World War which was held at the Navy Yard on the night of May 22. The two principal speakers were Lieut. Comdr. Richard E. Byrd, Jr., U.S.N., who is in command of the aircraft on the MacMillan Polar expedition, and Lieut. Comdr. Noel C. Davis, U.S.N.R.F., commanding officer of the Naval Reserve Air Station at Squantum, Mass. Commander Byrd outlined the tentative plans for the use of aircraft with the MacMillan expedition, and emphasized the fact that there is no competition between his air expedition and that of Amundsen, stating that the primary purpose of the MacMillan air expedition was scientific research and discovery and that a flight to the Pole if made would be a secondary consideration and only incidental to the main purpose of the flight. He said that present plans call for the establishment of a base at Etah, Greenland, where the planes will be put in commission and flown from there to the Polar sea, where for the first time in history a base will be established entirely by aircraft. Operating from this base on the shore of the polar sea they hope to explore a portion of the million square miles of territory which has been reported by various scientists as containing a new continent. It is expected that the three planes of the Polar Flight will arrive in Boston about June 10 where two of them will be placed aboard the Peary and on June 17, the Peary and the third plane will proceed to Wiscassett, Me., where it will be stowed aboard in preparation for the sail to Greenland. Commander Byrd's talk was particularly interesting due to the fact that he is married to a Boston girl and has spent much time here. He was in charge and entirely responsible for the establishment of the Naval Reserve Air Station at Squantum, which has had such an excellent record during the past year and a half.

Lt. Comdr. Noel Davis spoke on the tactical use of aircraft in the Navy, describing the various types of aircraft in use, what their functions are, and what might be expected of naval aircraft in the future.

Lieut. Robert J. Brown, Jr., commanding officer of the Boston Airport, has returned to Boston after a month's absence which included duty in Washington, and special duty in the various New England states.

We learned with much interest that two officers assigned to Boston had been selected by Maj. Gen. Andre W. Brewster, commanding general of the First Corps Area, to take part in the race for high speed airplanes this Fall. The officers selected are Lieut. James H. Doolittle who is at the Massachusetts Institute of Technology, and Capt. C. W. Ford, acting air officer of the First Corps Area.

On May 30, the Frank West Post of the American Legion, at East Pepperell, Mass., had a special aviation night at which time the films of the world flight were shown and a speaker was present to tell of the commercial use of aircraft and what the American Legion can do to help aviation in the United States.

Much interest is being shown in the forthcoming visit of Col. Paul Henderson to Boston on June 16 when he will be the guest of honor and principal speaker at the Air Mail luncheon given by the Boston Chamber of Commerce. New England is taking a great interest in the extension of the Air Mail and recently a dispatch was received from Rockland, Me., calling attention to the fact that they had two good landing fields and requesting that Rockland be included in any plans for the extension of the Air Mail to Maine. Portland, Augusta, Bangor and Waterville, Me., have already held meetings and have made application for extension of the Air Mail to their respective cities. Hartford, Conn., has also shown much interest in getting on the Air Mail route and Maj. Talbot O. Freeman, commanding officer of 43d Division Air Service, C.N.G., is coming to the Chamber of Commerce luncheon in Boston for the purpose of finding out how Hartford can proceed to help obtain Air Mail for New England.

* * *

We regret beyond words our seeming neglect in acknowledging the perfect tribute from Cy Caldwell in the May 4 issue of AVIATION, but we had just sent our last staff in when it arrived. We are however profoundly proud and grateful because outside of a tax statement, this is the only thing we have ever had written specially for us. We also acknowledge the several very delicate tributes to Boston, but we feel in justice, these should have been dedicated to a more solid Bostonian than ourselves, as we spent most of our young life on the West Coast before Larry Bell owned all the department stores out there and we can still remember Glenn Martin sliding through the streets of Los Angeles in a Stoddard-Dayton at fifty miles an hour with the approximate clearance in traffic of a roque ball in a wicket.

Boston and Cleveland seem about on a par as far as air news is concerned. We are not so sure about grapefruit, but we went up to the farm in Vermont last week and the rhubarb looks good. This is a standing invitation to Cy to visit the farm this summer and try some real Vermont rhubarb pie. Speaking of Vermont, we were happy to learn while there that James Hartness, former governor and so far as we know the first governor in the United States to get a pilot's license, is recovering from a major operation and is expected to be in better health than for several years past. Ex-Governor Hartness has done much for aviation in Vermont, and has been responsible for the establishment and maintenance of a landing field at his home town of Springfield.

* * *

Another Governor who is much interested in aviation and who shows great promise of following accurately the footsteps of Hiram Bingham straight to the Senate is Governor Ralph O. Brewster of Maine. Governor Brewster is an honorary member of the State of Maine Chapter of the N.A.A., and at the present time is making an investigation in regard to the establishment of a landing field at Augusta. He has just returned from Washington where he saw President Coolidge in regard to the Annual Governor's Conference to be held at Poland Springs, Me., this June, and it is understood that it is possible an air demonstration will be a part of the program.

An All Technology Reunion of the Massachusetts Institute of Technology will be held at Boston on June 11 and 12, and many of the Technology men active in aviation will return for it. The quarters of the equipment of the Department of Aeronautical Engineering will be available for inspection, and Professor Warner is also endeavoring to have some exhibition flying as a part of the program at the All Technology Picnic on Thursday June 11.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Miller Field Meet

An attempt to beat the world's parachute record, made by Sergt. Randle Bose recently, will be made by "Dare Devil" Ben Grew, at the Miller Field Meet, June 20. Bose startled the country a few weeks ago by dropping 1500 ft before opening his parachute. In sending in his entry for the meet, Grew stated, "I guarantee to beat the record of Sergt. Randle Bose, who dropped 1500 ft. at Mitchel Field on April 2nd." With Grew and many other noted jumpers entered, the Parachute Jumping event promises to be one of the most thrilling on the program. It is expected that Sergeant Bose will be on hand at Miller Field to repeat his famous jump.

Of equal interest will be the great sham battle between an attacking fleet of airplanes and whippet tanks and the defending aerial forces of Miller Field. Phosphorous bombs will be used by both squadrons of planes and the defenders will lay a smoke screen over the field to hamper the gunners on the tanks and protect the buildings from the attacking ships. While the entire sham battle will be kept at a safe distance from the spectators, every move in the great conflict will be plainly visible.

This contest will be followed closely by another almost as spectacular when three planes will give a demonstration of aerial combat. A two-seater observation plane will be attacked by two single-seater pursuit planes. During the contest the observer will jump from the two-seater plane as a test of this method of escape in actual combat. A number of speed races have been scheduled for the meet, including a seaplane race to the Statue of Liberty and return to Miller Field. Sky-writing is still a phenomenal spectacle to most people and the demonstration of this new art by two planes of the Sky Writing Corporation of America, is another feature that will interest thousands.

Practically all of the large Army, Navy, Marine Corps and civilian air stations are out to win honors for their division. A spirit of friendly rivalry has developed between the varied branches of the service indicating that there will be some keen competition for the individual prizes as well as those to the different fields. More than two hundred planes are assured and many more are expected to announce their coming before June 20.

Maj. George A. Vaughn, Jr., D.S.C., D.F.C., commanding officer of the 27th Division Air Service, announced that arrangements were being made to assure the safety of the 100,000 people who are expected to attend. Parking space has been provided for cars and a large grand stand is under construction. Several hundred prominent people have promised to attend. Miller Field is particularly suited for the New York Air Meet, being situated on the edge of New York Bay so that both sea and land maneuvers will be in plain view of everyone.

In arranging the meet Major Vaughn is being assisted by William O. Rector, adj.; Curtis Wheeler, operations officer; Lawrence G. Brower, flying officer; H. L. Von Leckum, medical officer; 1st Lieuts. Olliffee E. Thomas, Arthur W. Sowdon, Kendrick J. Noble, Joseph E. Morris, Ambrose A. McCarthy, Leonard F. Long, Chas. J. Kidder, Edwin J. T. Westbrook, and 2nd Lieuts. Carl W. Rach, Harold A. Waterworth, Younger and Hall and the entire enlisted personnel of the 27th Division Air Service.

The following is the official program and list of prizes.

1. ON TO MILLER FIELD: Open to all types of Planes. (a) To organization sending greatest number of Planes. 1st Prize, Silver Loving Cup. (b) To organization flying greatest number of ship miles. 1st Prize, Silver Loving Cup.

2. FORMATION FLIGHT: 1st Heat, 11:00 A. M. Open.—Judged on maneuverability, elapsed time for assembly and number of planes. 1st and 2nd Prizes, Silver Cup. Time of other heats to be posted by field announcer.

3. LANDING TO MARK: 11:30 A. M. Open.—Throttles to be closed at 500 ft. altitude directly over landing circle. 3 landing trials for each plane. 1st Prize, Gold Watch. 2nd Prize, Silver Cigarette Case. 3rd Prize, a pr. Meyrowitz Goggles.

4. ALTITUDE RACE: 12 M. Open.—Planes must take off and land within 15 min. 1st Prize, Gold Watch. 2nd Prize, Silver Cigarette Case. 3rd Prize, a pr. Meyrowitz Goggles.

5. THE BLUE RIBBON AIRPLANE: 12:30 P. M. Open.—Mechanics sweep stakes for the best conditioned airplane. 1st Prize, 4prs. of Gold Cuff Links to members of winning ship's crew.

6. SEAPLANE RACE: 1:00 P. M. Open.—Course Miller Field to Statue of Liberty and return (Course B). 1st Prize, Gold Watch. 2nd Prize, Silver Cigarette Case. 3rd Prize, a pr. Meyrowitz Goggles.

7. BATTLE BETWEEN AIRPLANES AND TANKS (Demonstration). Attacking tanks will be bombed from low altitude by airplanes.

8. DH SPEED RACE: 1:30 P. M. Open.—(U. S. Army Regulation DH Planes Only). Distance 3 laps of course "A." Finish over Field. 1st Prize, Gold Watch. 2nd Prize, Silver Cigarette Case. 3rd Prize, a pr. of Meyrowitz Goggles.

9. SKY WRITING: (Demonstration) 2:00 P. M.

10. AERIAL COMBAT: (Demonstration) 2:30 P. M.—Two-seater Observation Plane attacked by two single-seater pursuit planes. Observer will jump from the two-seater.

11. NATIONAL GUARD SPEED RACE: 3:00 P. M.—Limited to National Guard Squadrons only. Distance, 2 laps of course "A." Finish over Field. 1st Prize, Gold Watch. 2nd Prize, Silver Cigarette Case. 3rd Prize, a pr. of Meyrowitz Goggles.

12. STUNT FLYING: 3:30 P. M. Open.—1st Heat. To be judged on variety of stunts and skill shown in maneuvering. 1st Prize, Gold Watch. 2nd Prize, Silver Cigarette Case. 3rd Prize, a pr. of Meyrowitz Goggles.

13. SMOKE SCREEN LAYING: Demonstration.—4:00 P. M.

14. OPEN SPEED RACE: 4:30 P. M.—Distance 3 laps of course "A." Finish over Field. 1st Prize, Gold Watch. 2nd Prize, Silver Cigarette Case. 3rd Prize, a pr. of Meyrowitz Goggles.

Connecticut National Guard

The Air Service of the New England National Guard is composed of two Squadrons. One of these, the 118th Observation Squadron is located at Hartford, Conn., with its base at Brainard Field. This organization can well be proud of its record.

On Friday June 13, 1923, it received its planes and equipment and began an extensive work in flying. On July 4 of the same year the Squadron flew its own planes to Mitchel Field, L. I., where it trained for two weeks without accident. The following summer it again trained at Mitchel Field.

The Squadron boasts of eighteen officers and eighty enlisted men. On Brainard Field there are two large steel hangars belonging to the Squadron and housing eight planes in first class flying condition. There are four mechanics and an Instructor-Sergeant in flying stationed at the field permanently. The number of flying hours to date totals eight hundred and thirteen pilots have been trained. Weekly classes in engineering, rigging, radio, photography and armament are carried on weekly at the State Armory and are taught by the officers of the Squadron. The Squadron is under the command of Maj. Talbot O. Freeman, Connecticut National Guard, and instruction is under the supervision of Lieut. Louis N. Eller, U.S.A. (D.O.L.) The Officers' classes, which are held weekly at the State Armory and under the guidance of Lieutenant Eller, qualify the officers and pilots of the squadron for all the work and the duties required by an Observation Squadron. The planes used are JN4H and this summer at Mitchel Field the Squadron will take up the DH4.

Army Air Orders

Spec. Or. 274, assigning First Lt. Arthur K. Ladd, A.S., to Brooks Field, amended to assign Lieutenant Ladd to Off. Ch. A. S., Washington.

First Lt. Reuben C. Moffat, A.S., Washington, to Dayton.

Capt. Fowler Stoddard Smith, Spec. Res., Dayton, to A.S., Washington, for training, reverting to inactive status June 8.

Sec. Lt. George Edward Lightcap, jr., A.S., Brooks Field, transferred to Inf., Fort Sam Houston.

Capt. Alfred F. King, jr., A.S., Kelly Field, to Brooks Field.

Maj. George E. A. Reinburg, A.S., assigned to duty Chanute Field upon completion of foreign tour.

Sec. Lt. Dean Stanley Ellerthorpe, A.S., Kelly Field, transferred to Coast Art. Corps, Fort Eustis.

Following officers A. S. from stations indicated to McCook Field for instruction in A. S. Eng. Sch.: Maj. Thomas Dew Milling, Langley Field; Capt. Paul T. Bock, Marshall Field; First Lts. Robert G. Breene and Clinton F. Woolsey, Brooks Field; First Lt. Carl F. Greene, Fairfield; First Lt. Phillips F. Whitely, Langley Field; First Lt. David G. Lingle, Washington; First Lt. Ennis C. Whitehead, Selfridge Field; Sec. Lt. Glen T. Lampton, Pope Field.

First Lt. Ivan G. Moorman, A.S., Kelly Field, to McCook Field.

First Lt. Jesse Joseph Owen, A.S. Res., Washington, to active duty McCook Field for training, reverting to inactive status June 15.

First Lt. Muir S. Fairchild, A.S., McCook Field to Langley Field.

Maj. William B. Duty (Phil. Scouts), student A. S. Tact. Sch., Langley Field, designated as student at Com. & Gen. Staff Sch., Fort Leavenworth.

Spec. Or. 77 relieving Maj. Lewis H. Brereton, A.S., from duty as instructor at A. S. Tact. Sch., Langley Field, and ordering Major Brereton to report at Fort Leavenworth revoked.

Maj. Barton K. Yount, A.S., McCook Field, upon completion of temporary duty, to Amer. Emb., Paris.

Capt. Francis M. Brady, A.S., Paris, to Langley Field.

Sec. Lt. Rupert Davidson Graves, A.S., Kelly Field, transferred to Inf., Fort Sam Houston.

Sec. Lieut. Orrin Everette Ross, A.S. Res., Washington, to active duty Bolling Field, for training, reverting to inactive status June 29.

Staff Sgt. William H. Capell, A.S. Tech. Sch., Chanute Field, to Aberdeen Prov. Ground.

Staff Sgt. Donald W. Shoemaker, A.S., 49 Bomb. Sqd., Chanute Field, transferred to A.S. Tech. Sch. that station.

Capt. Harrison W. Flickinger, A.S., Mitchel Field, to Middletown, Pa.

U. S. NAVAL AVIATION

Brokering from the Los Angeles

Radio trading on Wall Street by persons in the air was developed May 27 on the flight of the dirigible Los Angeles over New York City and up the Hudson River.

E. O. McDonnell, President of N. Y. Chapter of the N.A.A., bought 300 shares of stock as he sat in the control car of the Los Angeles 3,000 ft. above the Hudson River near Newburgh. His order was radioed to the Lakehurst station and relayed by telephone to his firm, which executed the order on the floor of the New York Stock Exchange.

Charles Lawrance, President of the Wright Aeronautical Corporation, another of the thirty passengers carried by the Los Angeles, put in a flying radio bid for the purchase of twenty-five shares of stock. He also radioed a request for quotations on the Wright stock.

The Los Angeles flew from Lakehurst to New York Harbor, being sighted from St. George, S. I., at 2.30 p. m. Crowds on the streets, in parks and on roof-tops watched the airship at a height of about 1,000 ft. over Manhattan.

The Los Angeles made the trip on three of its five engines. One went out of commission on May 26, and the other May 27. Both mishaps were of a minor nature and will not interfere with the flight of the Los Angeles on June 7 to Minnesota, where President Coolidge is to make an address at the Minnesota State Fair. Capt. George W. Steele, executive officer of the naval air station at Lakehurst, who commanded the trip, said that it was successful and uneventful.

Among the passengers were Warren Akerson of Plainfield, N. J., Charles Lawrance, President of the Wright Aeronautical Corporation, Bradley Norman Jr. of 1 Broadway, New York City, a broker, Russell E. Sard of Hayden, Stone & Co., brokers in New York City, and Frank L. Dailey of New Brunswick, general manager for the Johnson & Johnson Company.

P. & A. Photos

Above—Fairey Fawn observation and light Bomber. Below—Blackburn Fleetspotter. Both are powered with the Napier Lion engine.

Naval Air Orders

Orders directing Lt. (jg) Wiley N. Hand to proceed to Nav. Air Sta., Pensacola, revoked, Lieutenant Hand to continue duty U.S.S. Sloat.

Following officers det. Nav. Air Sta., Pensacola, to Aircraft Squads., Battle Fleet, Lts. Gerald F. Bogan, Joseph J. Clark. Lts. (jg) James V. Carney, Ward C. Gilbert, Grover B. H. Hall, Jesse G. Johnson, Ens. Eaton A. Boothe, Delbert S. Cornwell, Harold G. Hazard, Howard L. Jennings, Francis B. Johnson.

Following officers det. Nav. Air Sta., Pensacola, to Aircraft Squads., Sctg. Fleet: Lts. (jg) Emanuel C. Beck, William D. Johnson, Ens. William B. Ault, Warren K. Berner, Robert E. Blick, Charles W. Crawford, Herbert S. Duckworth, Rudolph L. Johnson, Bates H. Johnston.

Orders directing Lt. Daniel W. Tomlinson to proceed to Aircraft Squads., Battle Fleet, revoked, Lieutenant Tomlinson to continue duty at Naval Academy.

Lt. George F. Chapline det. Mass. Inst. Tech., Cambridge, to Aircraft Squads. Battle Fleet.

Lt. Bertram Grossbeck det. Marine Bks., Quantico, to Nav. Air Sta., Coco Solo.

Lt. George L. McClintock det. Nav. Air Sta., Coco Solo, to Marine Bks., Quantico.

Publisher's News Letter

We have often wondered where some of the data given out at the White House came from When we saw the last paragraph of the statement recently issued by the President there was such a familiar resemblance to an editorial in AVIATION of April 27, under the caption of "Bringing Flying to the User," that making a comparison was inevitable The parts from the statement issued at the White House are in italics, that from the AVIATION editorial is quoted

"Twenty-two schools are now running their cards [in AVIATION] and their fields are scattered from coast to coast"

At the present time there are twenty-two schools in operation, and their flying fields are scattered from coast to coast

"Gradually the itinerant or gypsy flier, is becoming a fixed base operator. The fixed base also enables him to keep his ships in better condition This in turn gives him a more stable and responsible position financially"

The operators of such aircraft were usually known as "gypsy fliers," but in the last few years the "gypsy" has been developing into a fixed base operator The fixed base and school have provided the incentive for the "gypsy flier," to keep his aircraft in better condition and have placed him in a more stable and responsible financial position

We greatly appreciate the use of the editorial opinion of AVIATION and can only hope with due modesty that more of such opinions may be given widespread currency.

* * * *

There is one other fact regarding the White House statement that may be properly mentioned This statement shows that the government assumes that because there are twenty-two schools advertising in AVIATION that this list is complete. We can only say that we wish this observation held true in other aircraft lines as well. Unfortunately this is not so, for many manufacturers of aircraft supplies seem to be under the impression that creating good will by advertising in the trade press does not have the same effect as in other lines The "one customer" idea is so firmly rooted that no amount of reasoning can convince some impenetrable minds that the good will of the users, both pilots and mechanics are to be sought as well as the purchasing departments. But many companies that are selling large orders to the government regard advertising of their products as unprofitable expense, rather than a part of their sales cost Perhaps the use of the list of flying fields advertised in AVIATION by "The White House Spokesman" may help some of these backward concerns to see the light.

* * * *

The interest aroused by trade papers is often minimized. It is only rarely that definite instances come to the attention of a publication in such form that they give a new or interesting viewpoint Here is a letter just received.

"You stopped my subscription to AVIATION in April, so I owe you for nine months Enclosed you will find check for $7 00 for the nine months and a year more I am a farmer and not an aviator, but I am interested in aviation, and hope I will live long enough to see them as thick as autos. As a farmer I have not had any money to spare but as I have it now, I am sending it before I use it for something else"

Appreciation such as this is genuinely welcomed as it stimulates AVIATION to better and more enthusiastic efforts.

* * * *

Grover Loening has rendered a real service by persuading Orville Wright to state the conditions upon which he would give the first airplane to The Smithsonian Institution If an independent commission were appointed that would hear the both sides of the Wright-Langley controversy and then label the machines without prejudice or personal leanings, the entire aeronautical world would be glad to have this partisanship matter settled once and for all The Wright machine will be on exhibition long after the present generation is forgotten. Should anything happen that would mar or destroy this historic relic, blaming anyone would not help. Now is the time to have the dispute settled and no effort should be too great to bring about a solution to everyone.—L.D G

A word may be said at this time about the forthcoming volume of *Who's Who in American Aeronautics* It is in the hands of the printing office and will be issued during the summer. About one hundred and fifty additional biographies have been added and some omitted Hereafter it is hoped that it can be issued annually and every biography kept up to date. The cooperation of all who have helped to make the book as complete as it can be made is appreciated It will gradually become one of the indispensable desk reference books for everyone interested in aeronautics It might be mentioned that the edition will be limited and advance orders at $2 00 a copy indicate that the edition will be sold out within a short time after publication.

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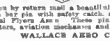

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